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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WEATHERBY, ELLSWORTH

ART UNIT

PAPER NUMBER

3768

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/723,486	Applicant(s) DEFREITAS ET AL.	
	Examiner ELLSWORTH WEATHERBY	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 57-100 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 57-100 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 57-100 in the reply filed on 09/25/2009 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 57-68, 73, 79-92, 95 and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberhard et al. (USPN 6,751,285) in view of Tang et al. (Pub. No.: 2003/0026386).

Eberhard et al. '285 (hereinafter Eberhard) teaches a method of imaging a patient's breast with x-rays using a flat panel digital x-ray imager to obtain both two dimensional image data for a conventional mammogram data and three-dimensional (3D) image data for tomosynthesis images in a single breast compression, using an anti-scatter grid in obtaining some but not all the image data, comprising: immobilizing a patient's breast between an x-ray source and a flat panel digital x-ray imager (col. 3, l. 65-col. 4, l. 9); energizing the x-ray source to emit x-rays at each of a plurality of different angular positions of the source relative to the breast while the breast remains

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immobilized, and concurrently using the imager to derive x-ray projection image data for the respective positions (col. 4, ll. 2-19); wherein the image data for at least one of said positions, called hereafter a mammogram position, are taken at a view matching that of a conventional CC and/or MLO view used in conventional mammography, and the image data for a plurality of other positions, called hereafter tomosynthesis positions, are taken at other relative angles of the source and breast (fig. 1; col. 2, l. 48- col. 4, l. 9: Here image data may be acquired in any order); optionally using an anti-scatter grid between the patient's breast and the imager for at least the mammogram positions and optionally not using the grid for at least some of the tomosynthesis positions (col. 6, ll. 9-18); and processing the image data taken for the mammogram position to form and display a mammogram and using the image data taken for said tomosynthesis positions to form and display tomosynthesis images of the breast (col. 3, l. 7, l. 64; claim 16).

Eberhard also teaches acquiring the images at a plurality of doses in accordance with the thickness such that a mammogram can be acquired at a given radiation dose and each image of the tomogram can be acquired at a lower dose (col. 4, l. 47-col. 5, l. 60).

Eberhard also teaches energizing the x-ray source at different angular positions comprises energizing the source intermittently during a continuous movement thereof relative to the breast covering at least some said positions (col. 6, l. 65- col. 7, l. 17).

Eberhard further teaches energizing the source while stationary relative to the breast for at least one of said positions (col. 7, ll. 18-47).

Eberhard teaches all the limitations of the claimed invention except for expressly teaching using an anti-scatter grid between the patient's breast and the imager for at

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least the mammogram positions but not for at least some of the tomosynthesis positions. Eberhard also does not teach that acquiring x-rays at a kVp range substantially higher than 25kVp.

In the same field of endeavor, Tang et al. '836 teaches anti-scatter grids and collimator designs in imaging and mammography at 35kVp (abstract; 0010; 0098). Tang goes on, teaching methods for imaging while moving the anti-scatter grid, such that the anti-scatter grid is used for at least the mammogram positions but not for at least some of the tomosynthesis positions [0113-0128; 0218-0240].

Because Eberhard teaches optionally using an anti-scatter grid, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mammography system of Eberhard in view of the system or method of using the an anti-scatter grid in x-ray mammography Tang. The motivation to modify Eberhard in view of Tang would have been to avoid grid shadows, as taught by Tang [0005].

4. Claims 70, 72 and 93-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberhard et al. (USPN 6,751,285) in view of Tang et al. (Pub. No.: 2003/0026386) as applied to claims 57 and 94 above, and further in view of Karellas et al. (Pub. No.: 2003/0169847).

5. The mammography system of Eberhard in view of Tang teaches all the limitations of the claimed invention except for expressly teaching using a Tungsten target. Eberhard in view of Tang also do not expressly teach that at least some of the image data re acquired with x-ray in a range up to 50 kVp.

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6. In a related field of endeavor, Karellas et al. '847 teaches x-ray imaging (abstract). Karellas goes on, teaching the use of a Tungsten target [0149; 0209].

Karellas also teaches acquiring image data in a range near 50kVp [0088; 0280].

7. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify mammography system of Eberhard in view of Tang with the Tungsten target of Karellas. The motivation to modify Eberhard in view of Tang with Karellas would have been to utilize any of the known target, including the high power tungsten target of Karellas.

8. Claims 74-75 and 96-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberhard et al. (USPN 6,751,285) in view of Tang et al. (Pub. No.: 2003/0026386) as applied to claims 57 and 79 above, and further in view of Tumey et al. (USPN 5,941,832).

9. The mammography system of Eberhard in view of Tang teaches all the limitations of the claimed invention except for expressly teaching displaying the mammogram and tomosynthesis images for concurrent viewing.

10. In a related field of endeavor, Tumey et al. '832 (hereinafter Tumey) teaches computer digitization of mammogram image data (abstract). Tumey goes on, teaching the use of concurrent display of multiple mammography image data (col. 3, l. 51- col. 4, l. 2).

11. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mammography system of Eberhard in view Tang with the

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concurrent display of Tumey. The motivation to modify Eberhard in view Tang with Tumey would have been to provide efficient display of the datasets using known display means.

12. Claims 76 and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberhard et al. (USPN 6,751,285) in view of Tang et al. (Pub. No.: 2003/0026386) as applied to claims 57 and 79 above, and further in view of Wang et al. (Pub. No.: 2003/0212327).

13. The mammography system of Eberhard in view of Tang teaches all the limitations of the claimed invention except for expressly teaching that the mammogram and tomosynthesis images on adjacent screens.

14. In a related field of endeavor, Wang et al. (hereinafter Wang) teaches an adjunctive mammography system comprising an adjunctive display configured for quick, intuitive, interactive viewing of data derived from volumetric ultrasound scans, the data being displayed near a conventional x-ray mammogram display (abstract). Wang goes on, teaching the use of a plurality of adjacent screens, displaying mammogram and 3D image data [Fig. 1; claim 25].

15. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mammography system of Eberhard in view Tang with the displays of Wang. The motivation to modify Eberhard in view Tang with Wang would have been to provide efficient display of the datasets using known display means, as taught by Wang [abstract].

16. Claims 78 and 100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberhard et al. (USPN 6,751,285) in view of Tang et al. (Pub. No.: 2003/0026386) as applied to claims 57 and 79 above, and further in view of Hseih et al. (USPN 6,574,304).

17. The mammography system of Eberhard in view of Tang teaches all the limitations of the claimed invention except for expressly teaching that the tomosynthesis images represent thick slices of the breast, about 5 to about 10 mm thick.

18. In a related field of endeavor, Hseih et al. (hereinafter Hseih) teaches computer aided acquisition and display of medical images (abstract). Hseih goes on, teaching the acquisition of thick slice images about 5 to 10mm thick (col. 5, ll. 16-34).

19. Because Eberhard teaches variable thickness images, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mammography system of Eberhard in view Tang with the thick slice images of Hseih. The motivation to modify Eberhard in view Tang with Hseih would have been to acquire images of any thickness, as desired by an interventionalist, including the known 5-10mm slice thickness of Hseih.

Response to Arguments

20. Applicant's arguments filed 09/25/2009 have been fully considered but they are not persuasive. Regarding claims 57 and 79, Applicant alleges that the prior art of record, the combination of Eberhard in view of Tang does not teach taking a

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mammogram image and tomosynthesis images with the same equipment and while the patient's breast remains compressed. That is, applicant acknowledges that the primary reference, Eberhard teaches 3D tomosynthesis images. However, applicant considers Eberhard's acquisition of mammographic tomosynthesis as not additionally taking mammograms or mammogram images with the same equipment and while the breast remains compressed. Here, the Examiner respectfully disagrees. Looking to present claim 57, for example, the claim calls for "using a flat panel imager to obtain both two dimensional image data for a conventional mammogram data...wherein the image data for at least one of said positions, called hereinafter a mammogram position, are taken at a view matching that of a conventional CC and/or MLO view used in conventional mammography, and the image data for a plurality of other positions, called hereinafter tomosynthesis positions...processing the image data taken for the mammogram position to form and display a mammogram". This claim language is sufficiently broad so as not to exclude diagnostic mammography, computed tomography or especially mammographic tomography passing through a CC or MLO view. Referring to the present specification (0007) for claim interpretation suggests that image data taken at the different positions can be processed to generate image slices of the breast, where, in one example, the image plane or planes are the same as those of a typical conventional mammogram. This is the same as the method disclosed by Eberhard (col. 1; ll. 15-31; col. 2, ll. 58-60). That is, Eberhard also teaches mammographic tomosynthesis (Abstract; Fig. 1, ref. 14; col. 2, ll. 58-60), where views (col. 1, ll. 20-25: "view refers to a single projection image") and single cross sectional images (col. 1, ll.

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25-28) are collected to form the three-dimensional data set (col. 1, ll. 26-30). The views are acquired from both the CC and MLO view angles all while the breast remains compressed in a single compression (col. 3, l. 65- col. 4, l. 19; col. 4, l. 47- col. 5, l. 3; Fig. 1). Accordingly, the Examiner maintains that Eberhard teaches the claimed image data taken at a view matching that of a conventional CC and/or MLO view, which is processed to form and display a mammogram.

21. Applicant further alleges, that the combination does not teach the using a grid in any imaging position. The Examiner again disagrees. First, Eberhard teaches optionally using or not using an anti-scatter grid for projection views (col. 6, ll. 11-17). However, the secondary reference, Tang further elaborates by providing a grid that can be moved during imaging to prevent over or under exposure and for use in mammography (e.g. 0109; 0110). Therefore, the examiner stands the combination of Eberhard in view of Tang teaches all the limitations of claims 57-68, 73, 79-92, 95 and 99. Their respective dependants stand rejected on the same grounds set forth by the 06/25/2009 Non-Final Rejection.

22. Because Applicant has not overcome the grounds of rejection set forth by the 06/25/2009 Non-Final rejection, all pending claims stand rejected on the grounds set forth above.

Conclusion

23. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELLSWORTH WEATHERBY whose telephone number is (571) 272-2248. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eric F Winakur/
Primary Examiner, Art Unit 3768

/EW/